

**REMARKS/ARGUMENTS**

Reconsideration of this application is requested. Claims 1-33 are in the case.

**I. THE ANTICIPATION REJECTION**

Claims 12 and 13 stand rejected under 35 U.S.C. §102(b) as allegedly anticipated by or, in the alternative, under 35 U.S.C. §103(a) as obvious in view of, prior art discussed in the specification. In addition, claim 12 stands rejected under 35 U.S.C. §102(b) as allegedly anticipated by Prough. Those rejections are respectfully traversed.

As now claimed, the method of the invention is directed to producing mechanical pulp from a cellulose-containing material. The method comprises subjecting the material to a first refining step to produce primary fines consisting essentially of middle lamella fragments and materials originated from the parenchyma cells and containing lignin and extractives. The material is subjected to a second refining step to produce secondary fines having about the same size as the primary fines but having a different composition. The pulp is fractionated after the first refining step but before the second refining step, to separate primary fines from the pulp, whereafter said separated primary fines are removed from said production of mechanical pulp. New Claim 32 (corresponding to previous claim 12) is directed to mechanical pulp from a cellulose containing material produced according to claim 14. New claim 33 (corresponding to previous claim 13) is directed to paperboard, at least partly produced from a mechanical pulp from a cellulose containing material produced according to claim 14.

The problem addressed by the present invention focuses on problems related to taste, smell, strength and bulk properties of mechanical pulps. In addition, as much as

possible of the cellulose material should be used in order to maintain a high yield. The invention aims at providing mechanical pulp having a low density, i.e. a high bulk, with good strength properties, especially in the z-direction, while at the same time having a low content of extractives and manganese.

This is achieved according to the claimed invention by fractionating the pulp after the first refining step and before the second refining step, in order to selectively separate primary fines which are then removed from the production of mechanical pulp. The importance of this order of steps is that fractionation performed after the second refining step (which yields secondary fines of about the same size as the primary fines) would result in removal of the secondary fines which do not give rise to the same disadvantages to the pulp as the primary fines and, indeed, are useful in that they give rise to desirable effects on bonding degree and light scattering in the paper and paperboard, and to some extent on the yield.

There are two types of fines material. Primary fines largely originate from a certain morphologic area of the wood material, e.g. cell corner, middle lamella and outer layers of the fibre wall, or from non-fibrous material such as parenchyma cells. Accordingly, primary fines contain a high content of metals and extractives. The expression "primary fines" is relates to "primary refining", where the wood chips are defibrated and the fibres are separated.

Secondary fines are formed in a subsequent refining step and consist essentially of fibre wall material that is peeled off. The secondary fines have a composition similar to the fiber itself and therefore are "useful" in the pulp. Primary fines differ from fines of the same size, produced later on in the process, in that their presence is deleterious to

the final product. It will be understood that this is specific to mechanical pulps, since refining is not used in the production of chemical pulp, and fines material formed in the production of chemical pulp cannot be divided into "primary" or "secondary" fines.

From the above discussion, it will be clear that the disclosure at page 1 lines 10-13 does not anticipate or suggest the pulp and paperboard of new claims 32 and 33. According to the invention, the pulp is fractionated **after** the first refining step but **before** the second refining step, to separate and remove the primary fines from the pulp. Prough does not disclose or suggest such a methodology. The mechanical pulp produced according to the present method is therefore not the same as that produced according to Prough, or as mentioned on page 1 of the present specification. Withdrawal of the anticipation/obviousness rejection of claims 12 and 13 is accordingly respectfully requested.

## II. THE OBVIOUSNESS REJECTIONS

Claims 1, 3-10 and 12 stand rejected under 35 U.S.C. §103(a) as allegedly unpatentable over Prough et al (U.S. Patent 4,731,160). Claim 11 stands rejected 35 U.S.C. §103(a) as allegedly unpatentable over Prough and further in view of prior art contained in the specification. Claim 2 stands rejected under 35 U.S.C. §103(a) as allegedly unpatentable over Prough alone or in combination with Hoglund et al. Claim 10 stands rejected under 35 U.S.C. §103(a) as allegedly unpatentable over Prough and further in view of Dublesten et al. Those rejections are respectfully traversed.

Prough describes a method designed to result in improved bleachability of mechanical pulps. This is achieved by subjecting a fiber fraction to displacement

bleaching in the presence of hydrogen peroxide. The Prough method centers on producing enhanced drainage characteristics of the mechanical pulp to permit pulp of higher brightness to be produced.

Prough is clearly directed to solving a different problem from that of the present invention. Moreover, the fractionation described by Prough does not occur after the first refining step but before the second refining step, as now claimed. Absent any such disclosure, it is clear that Prough cannot suggest the presently claimed method.

The two refiners (11) and (12) in Prough do not constitute "a first refining step" in accordance with the presently claimed invention. According to Figure 1 of Prough, the pulp passes both the refiners (11, 12) to the two separators (15, 16), whereafter the fractions continue to the mixers (25, 41) to commence the bleaching process. Thus, fractionation takes place only after the pulp has been finally refined. The second refiner (12) in Prough is called a "secondary refiner", while the first one is called a "primary refiner". If the present invention was applied to Prough, the fractionation would take place between the refiners (11) and (12) and the accept, i.e. the primary fines, would be led away from the process while the reject would be led on to the refiner (12). There is absolutely no suggestion of this in Prough.

Based on the above, it is clear that one of ordinary skill in the art at the time of the present invention would not have been motivated to arrive at the claimed invention based on the combined disclosures relied on by the Examiner. Absent any such motivation, a *prima facie* case of obviousness has not been generated in this case. The secondary art relied upon by the Examiner does not cure the deficiencies of Prough. Reconsideration and withdrawal of all of the outstanding obviousness rejections are

accordingly respectfully requested.

**III. AMENDED CLAIMS**

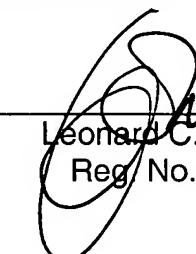
Claims 1-13 have cancelled without prejudice and replaced by new claims 14-33.

Claim 14 has been arrived at by incorporation of claim 3 into claim 1. No new matter is entered.

Favorable action on this application is awaited.

Respectfully submitted,

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